CAPSTONE PROJECT

RECIPE PREPARATION AGENT

Presented By:

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2. Github :- https://github.com/the-aibytes/IBM-INTERNSHIP

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OUTLINE

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- System Development Approach
- Algorithm & Deployment
- Result (Output Image)
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PROBLEM STATEMENT

Cooking meals using only available ingredients is often challenging. Many people waste food simply because they can’t think of a suitable recipe using what's already in their kitchen. Others face difficulty finding meals that fit dietary restrictions like vegan, gluten-free, or diabetic diets. There is a clear need for an intelligent solution that can suggest personalized recipes using ingredients at hand, offering substitutions and step-by-step instructions — all without requiring any coding knowledge from the user.

PROPOSED SOLUTION

The Recipe Preparation Agent is an AI-powered assistant built using Watsonx.ai and IBM Cloud Lite. It helps users prepare meals by suggesting recipes based on ingredients they already have. The key features include:

- ✅ Ingredient-Based Recipe Search: Users enter ingredients they have. The system searches for suitable recipes using Watsonx Web Search.
- ✅ AI-Powered Customization: Using Prompt Lab, Watsonx rewrites the recipes to match available ingredients, adjust quantities, and suggest alternatives.
- ✅ Dietary Preferences Support: The assistant considers dietary restrictions (e.g., vegan, gluten-free) and suggests healthy substitutions automatically.
- ✅ Step-by-Step Cooking Instructions: Clear and simple cooking steps are generated for users, including tips for saving time and effort.
- ✅ No Coding Required: The entire solution is created using Watsonx tools, not manual programming. It is deployed on IBM Cloud Lite.

This solution makes cooking smarter, reduces food waste, and supports health-conscious and sustainable meal preparation — all without writing a single line of code.

SYSTEM APPROACH

Technologies & Tools Used:

- Watsonx.ai (for Natural Language Processing and AI model orchestration)
- Watsonx Assistant (to create the conversational recipe bot)
- Watsonx Web Search Tool (for real-time recipe fetching)
- Watsonx Prompt Lab (to test and refine prompt templates)
- IBM Cloud Lite (for deployment)

Workflow Overview:

1. Watsonx Assistant collects user input.
2. Web Search retrieves recipes based on ingredients and preferences.
3. Watsonx.ai processes and refines recipe steps and substitutions.
4. Responses are presented back to the user in natural language.

ALGORITHM & DEPLOYMENT

Step 1: Input Collection (Watsonx Assistant)

- A chatbot is created using Watsonx Assistant.
- It prompts users to enter their available ingredients and dietary preferences.
- Example: "What ingredients do you have today?" → User enters: rice, onion, capsicum.

Step 2: Recipe Retrieval (Watsonx Web Search Tool)

- Watsonx searches the web for recipes containing those ingredients.
- Filters are applied for diet type (e.g., vegetarian, low-carb).

Step 3: Prompt Creation (Watsonx Prompt Lab)

- A prompt template is created: “Using the ingredients [user_input], find a suitable recipe and rewrite the instructions to exclude unavailable ingredients. Also suggest a vegetarian substitute if needed.”
- Prompt Lab runs this through a foundation model like Granite or Flan-T5.

Step 4: Recipe Customization (Watsonx.ai Models)

- AI refines the recipe steps:
- Adjusts quantities based on input servings.
- Suggests substitutions (e.g., tofu for paneer).
- Simplifies or explains cooking steps for beginners.

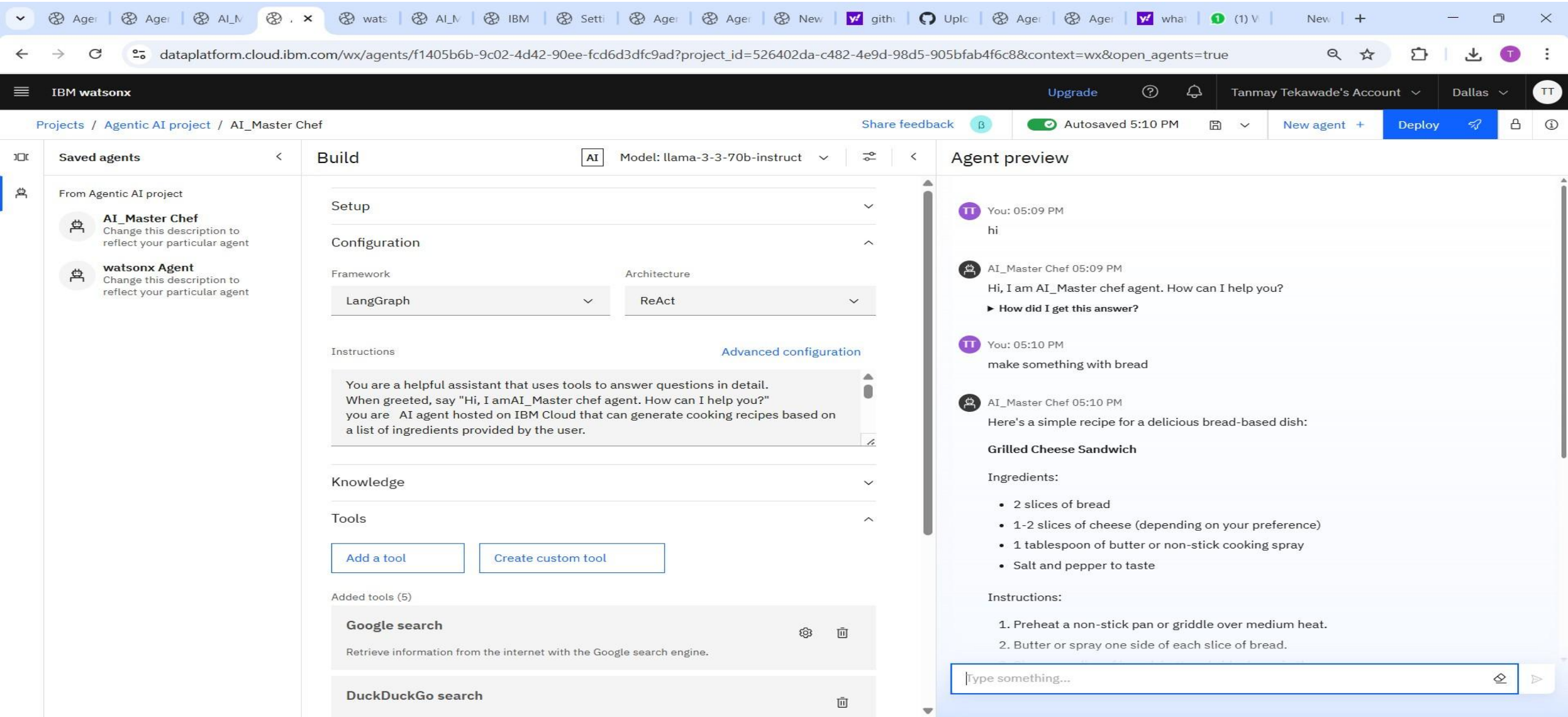
Step 5: Output Delivery (Watsonx Assistant Response)

- The final result includes:
- Recipe Title
- Customized Ingredients
- Step-by-step instructions
- Dietary or allergy notes
- Cooking tips

Step 6: Deployment

- Entire Watsonx flow is deployed via IBM Cloud Lite.
- Web interface or chatbot can be embedded in a simple webpage.

RESULT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IBM watsonx
Upgrade
Tanmay Tekawade's Account
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Projects / Agentic AI project / AI_Master Chef
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New agent
Deploy
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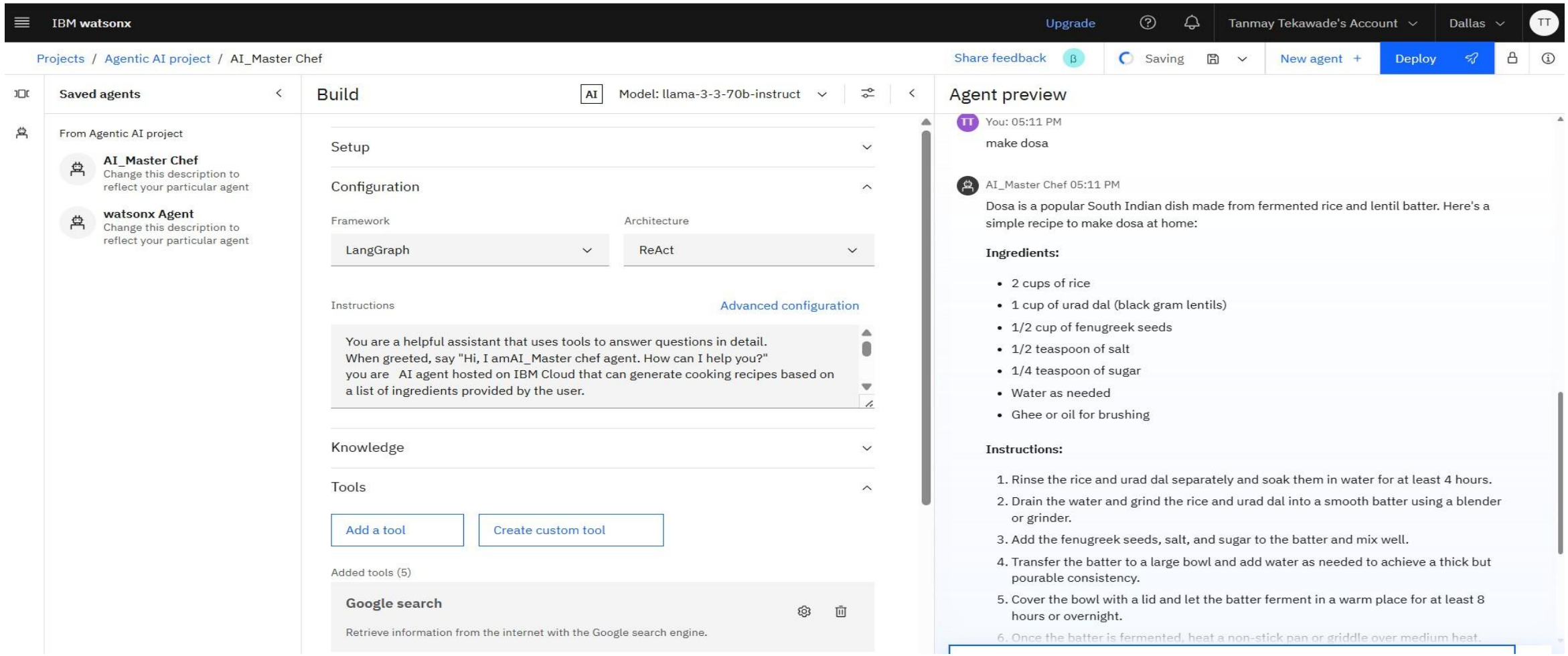
From Agentic AI project
AI_Master Chef
Change this description to reflect your particular agent
watsonx Agent
Change this description to reflect your particular agent
Build
Model: llama-3-3-70b-instruct
Setup
Configuration
Framework
LangGraph
Architecture
ReAct
Instructions
Advanced configuration
You are a helpful assistant that uses tools to answer questions in detail.
When greeted, say "Hi, I amAI_Master chef agent. How can I help you?"
you are AI agent hosted on IBM Cloud that can generate cooking recipes based on a list of ingredients provided by the user.
Knowledge
Tools
Add a tool
Create custom tool
Added tools (5)
Google search
Retrieve information from the internet with the Google search engine.
DuckDuckGo search
Agent preview
You: 05:09 PM
hi
AI_Master Chef 05:09 PM
Hi, I am AI_Master chef agent. How can I help you?
How did I get this answer?
You: 05:10 PM
make something with bread
AI_Master Chef 05:10 PM
Here's a simple recipe for a delicious bread-based dish:
Grilled Cheese Sandwich
Ingredients:
2 slices of bread
1-2 slices of cheese (depending on your preference)
1 tablespoon of butter or non-stick cooking spray
Salt and pepper to taste
Instructions:
1. Preheat a non-stick pan or griddle over medium heat.
2. Butter or spray one side of each slice of bread.
Type something...



CONCLUSION

The Recipe Preparation Agent successfully demonstrates how powerful AI tools like Watsonx.ai can be used to solve real-life problems without requiring any programming knowledge. This project helps users cook smarter by:

- Making use of the ingredients they already have.
- Offering personalized, health-conscious recipe recommendations.
- Reducing food waste.
- Saving time through simplified instructions.

Using Watsonx's web search, prompt engineering, and assistant tools, the system can retrieve and rewrite recipes in real-time, adapting them to user needs with zero code. The deployment on IBM Cloud Lite makes the solution practical, scalable, and easy to access.Overall, this project shows how AI-powered, no-code platforms can support sustainable living, personalized meal planning, and inclusive technology — making advanced cooking assistance available to everyone..

FUTURE SCOPE

As technology and user needs evolve, the Recipe Preparation Agent can be enhanced with several innovative and useful features:

- Voice & Image Input: Allow users to speak or scan ingredients using AI tools.
- Multi-language Support: Add regional language options for wider accessibility.
- Mobile App Integration: Turn the assistant into a full mobile app with offline mode.
- Calorie & Nutrition Info: Include health data for each recipe suggestion.
- Festival Recipes: Suggest seasonal or festive dishes automatically.
- Ingredient Expiry Alerts: Warn users about expiring items and recommend recipes to use them.
- Community Recipes: Let users share and rate custom recipes within the app.

This future scope focuses on making the assistant more personal, fun, practical, and culturally relevant, while still being accessible through Watsonx.ai's no-code environment.

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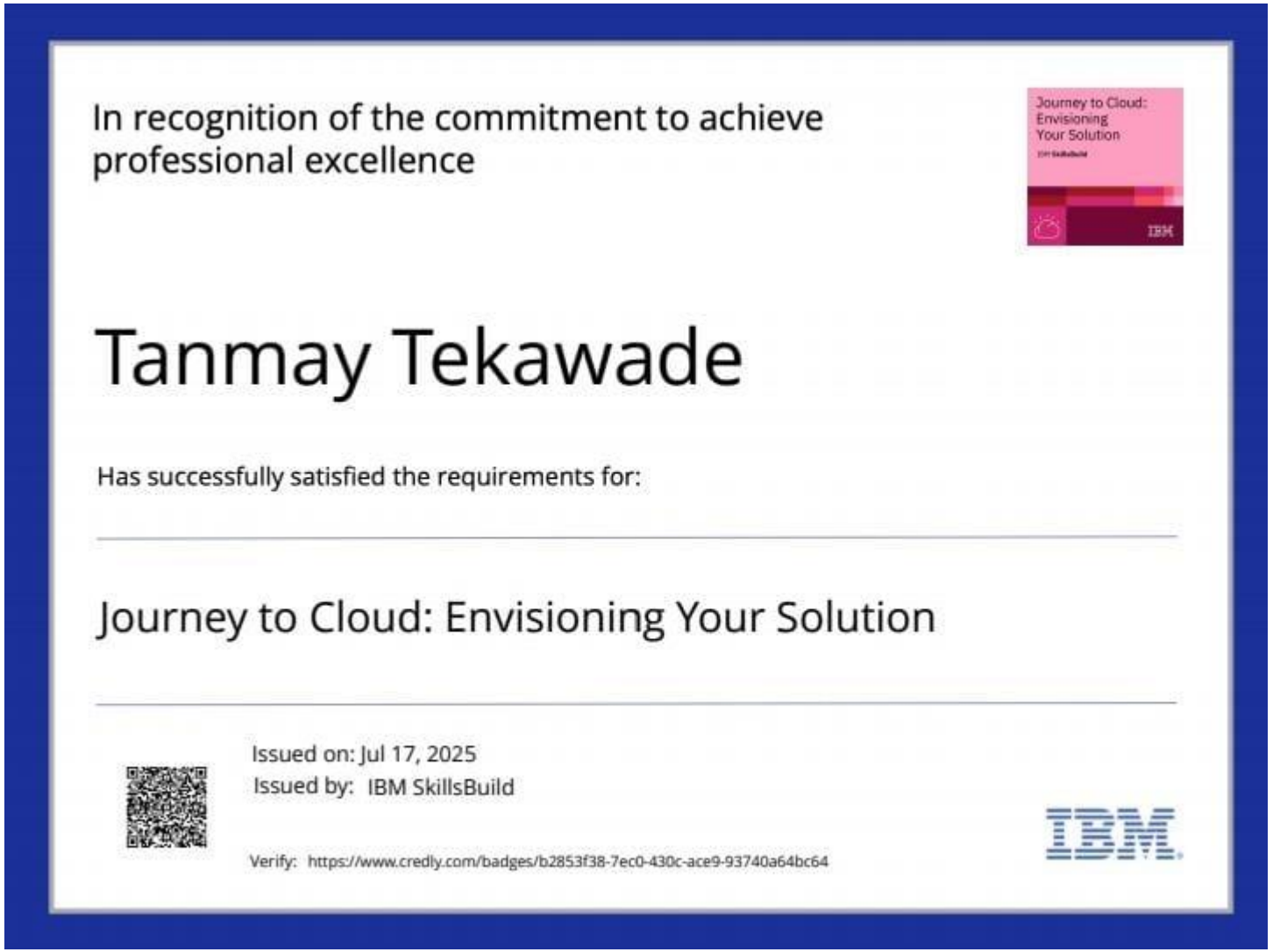
IBM CERTIFICATIONS



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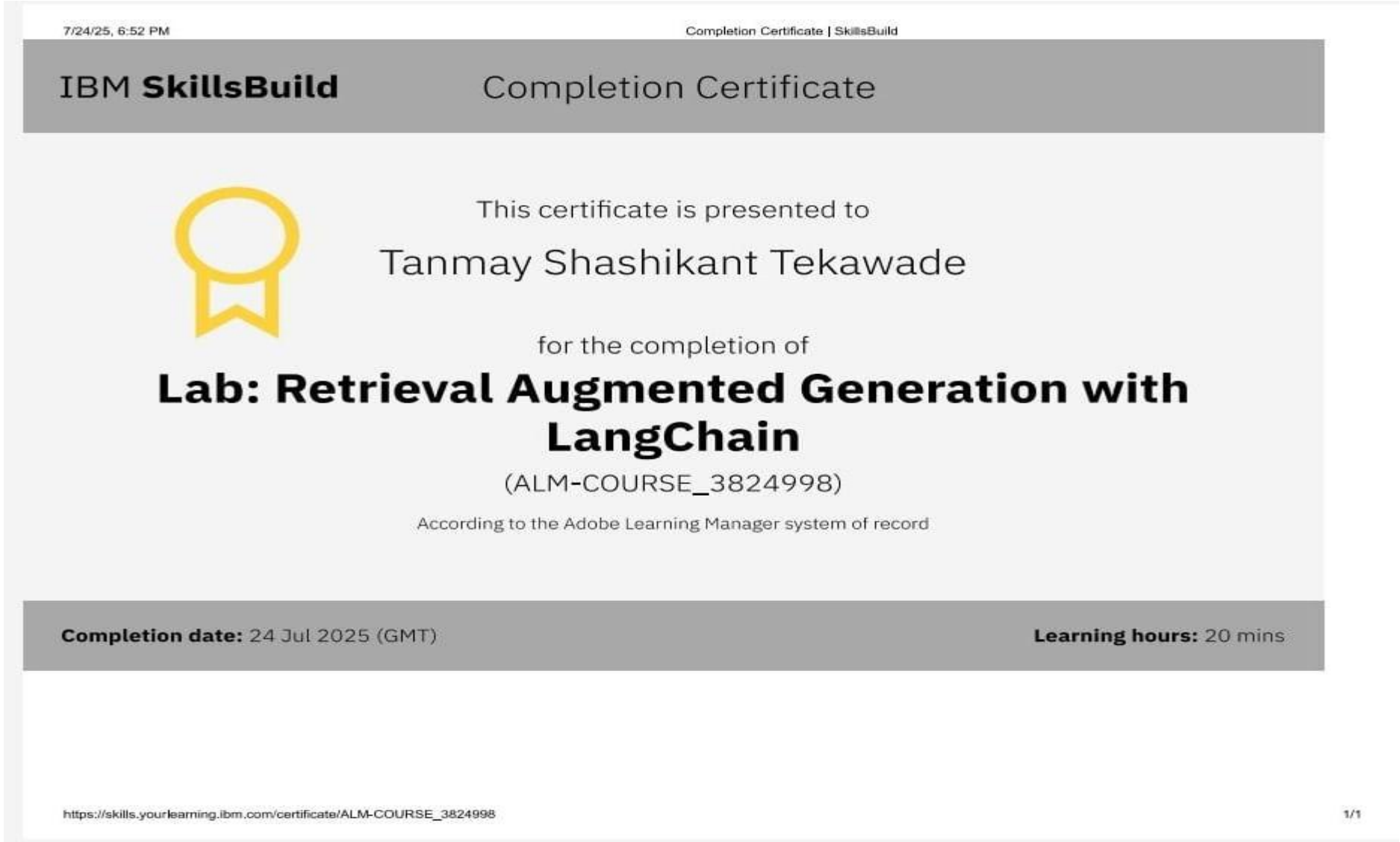

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